

Preface

This Broad Agency Announcement (BAA) solicits proposals from U.S. Universities to host the "University Countermining Research Center" (UCRC). The interdisciplinary UCRC is focused on developing in-depth knowledge and understanding of countermining phenomenology. The primary goal is to research different facets of environmental phenomenology with the aim of improving current understanding of the geo-environmental effects on mine/minefield sensing and neutralization approaches in order to support Army efforts to significantly enhance detection capabilities, reduce false alarms, and support the development of advanced mine/minefield neutralization approaches.

Through a competitive process, the Army Research Office (ARO) expects to award a single cooperative agreement having an initial performance period of five (5) years with three (3) one-year option periods. The estimated funding at the 6.1 level is \$2.5M the first year, beginning in fiscal year 2004 (FY04), followed by \$5M per year the remaining four years. A line of 6.2 funding, at \$2.5M a year, will begin in fiscal year 2006 (FY 06), carrying through fiscal year 2008 (FY08). Later, up to three option periods of one year each at similar funding levels may be considered. The total maximum value of the cooperative agreement to be awarded as a result of this BAA is \$52.5M for the eight-year period of performance. Proposals submitted in response to this BAA are to be based on this eight year potential period of performance at \$52.5M with \$30M proposed for the basic period of performance of five years and \$22.5M proposed for the three additional option years. Notwithstanding the agreement's maximum value, the amount of baseline 6.1 funding expected for each FY is \$5M, other than the first year, and 6.2 funding of \$2.5M starting in FY 06. This BAA is issued subject to the availability of funds. Funding is subject to Presidential, Congressional, and Departmental approval. In addition to the 6.1 and 6.2 funds, other fund types, subject to availability, may be provided as part of the cooperative agreement at the discretion of the government. The award is projected as a first quarter FY 04 start.

The selection process will be by a technical peer review evaluation. The deadline for submission of proposals is 4:00 p.m. local time on 10 October 2003. See Section 5, Instructions and Other Information to Offerors, for details.

Questions and Answers. Interested parties are encouraged to submit comments or questions via electronic mail to the following e-mail address QA@aro.army.mil. Only questions received by 4:00 p.m., 5 September 2003 shall be addressed. Comments or questions submitted should be concise and to the point, eliminating any unnecessary verbiage. In addition, the relevant part and paragraph of the BAA should be referenced. The Army's answers will be posted on a Q&A section of the ARO UCRC web-site at www.aro.army.mil as they become available or no later than 12 September 2003.

1. INTRODUCTION

The Army is in the process of a transformation to the Future Force, which will be more responsive, deployable, agile, versatile, lethal, survivable, and sustainable than today's forces. The Future Force requires revolutionary advances in performance of Army weapons systems, including improvements in engineered systems impacting soldier and systems survivability, e.g., communications and sensing capabilities (including sensing capability for landmine and minefield detection), among others. Such advances would represent breakthroughs to improve force projection and protection, and full spectrum situational dominance. See the "Objective Force White Paper" at <http://www.objectiveforce.army.mil> for further description of Army future operating capabilities.

Recent world events have highlighted the need for improved mine and minefield detection capabilities, as well as expedient neutralization technologies. The requirements envisioned for the Future Force and Future Combat Systems place even greater demands on development of improved countermine technologies, which will be needed in order to ensure the mobility and survivability of these smaller, lighter, and faster forces. The requirements include stand-off detection of minefields from aerial platforms ahead of an advancing force, on-the-move detection from vehicles of surface laid mines on and adjacent to roads, and the detection of individual buried landmines by dismounted soldiers.

Specific countermine needs have been identified by the April 2001 Government Accounting Office (GAO) report titled "Land Mine Detection – DoD's Research Program Needs a Comprehensive Evaluation Strategy," as well as by the recently completed Multidisciplinary University Research Initiative (MURI) on Demining. The GAO report states that "there is significant uncertainty about how well the sensors currently being developed will function in the various environmental conditions expected in countermine operations," and recommends a major R&D effort to understand the "target signature characteristics and environmental conditions" and to fill the "knowledge gaps about soil characteristics in future battlefields." The FY96-01 Demining MURI effort concluded, "Any realistic solution must exploit the totality of information contained in the target signature acquired by a sensor in its environmental context. This very likely will require multiple sensor systems working in a complementary and synergistic manner that utilizes sensor and environmental modeling, advanced signal processing techniques and data fusion approaches to overcome intrinsic single sensor limitations and the inherent variability of the natural soil environment."

Research has been initiated within the Department of Army to specifically address countermine phenomenology to meet these research challenges. As part of this diversified investment, the Army intends to establish a University Countermine Research Center (UCRC) to undertake a broad spectrum of fundamental research into the environmental phenomenology of landmine detection. This center will collaborate and cooperate with existing and emerging Army research and development efforts to support developing comprehensive geophysical and environmental characterization capabilities that can be

integrated with sensor predictive models to explain the sensor signatures of landmines and nuisance false alarms, and also be used to develop optimum and/or adaptive sensor signal processing and automated target detection approaches that exploit new environmental knowledge and timely environmental information. The UCRC effort will carry out basic and, later, applied research to establish a new understanding of environmental phenomenology related to landmine sensing, detection, identification, and neutralization that potentially will lead to enhanced current, and possibly new, landmine and mine sensing and neutralization technologies and/or approaches.

The UCRC will focus primarily on developing an in-depth understanding of the top half meter of the heterogeneous, complex, and dynamic terrestrial environment, the soil and soil-mine interaction phenomenology and on the geo-environmental factors that can affect mine detection and neutralization in different environmental settings within the context of a variety of sensing modalities and neutralization approaches. The UCRC will support ongoing Army phenomenology research and development efforts in and will be the Army's focal point for basic and early applied research in the following countermine-related areas, in priority order:

Topic 1: Soil Science and Environmental Physics;

Topic 2: Sensor Physics;

Topic 3: Signal Processing and Automated Target Detection Techniques, and;

Topic 4: Sensor Management.

2. COOPERATIVE AND COLLABORATIVE RELATIONSHIP

2.1. By definition, a cooperative agreement is a legal instrument which, consistent with 31 U.S.C. 6305, is used to enter into the same kind of relationship as a grant except that substantial involvement is expected between the DOD, DA, and the recipient when carrying out the activity contemplated by the cooperative agreement.

2.2. The Army S&T community has been tasked to address issues associated with countermine geo-environmental phenomenology. The initial phase of this research has been approved as an Army Science and Technology Objective (STO), starting in FY04, with the phenomenology research being conducted by the U.S. Army Engineer Research and Development Center (ERDC) in support of Night Vision and Electronic Sensors Directorate (NVESD) applied research and demonstration programs. The primary objective of this STO is to develop an integrated understanding of the geo-environmental phenomenology and exploit that understanding to reduce nuisance false alarms. The main approach of the ERDC phenomenology research effort is the development of a computational testbed that will integrate the geo-environmental phenomenology models with models of target-signatures, sensors, signal processing and automated target recognition algorithms to predict sensor performance, for both individual sensors and fused sensor modalities. The primary products will be a simulation testbed, supported by measurements, that can be used to define operational characteristics for a wide variety of environmental conditions and embedded mine targets and techniques to exploit geo-environmental phenomenology that impact mine and minefield detection sensors. The

UCRC will be responsible for developing basic and early applied research products suitable for transition into this computational testbed, and suitable support as necessary to fully integrate the UCRC products. The collaboration between the UCRC and the on-going Army S&T programs will provide the leap ahead technologies required to successfully address the countermine challenges.

3. PROPOSAL STRUCTURE AND CONTENT

Proposals submitted in response to this BAA shall include three volumes: the Research Program Volume, the Program Management Volume, and the Cost Volume. The Research Program Volume shall address the technical aspects of the work to be performed and will identify how research innovation will be accomplished. The Program Management Volume shall contain a technology transition plan and must indicate how the UCRC will coordinate and collaborate with the ongoing Army research activities and how it will attract and interact with the non-academic community to accomplish technology transition. The Cost Volume shall provide the budget breakdown by cost element and supporting financial information.

3.1. Research Program Volume

3.1.1. Background

Current and projected military operations feature worldwide deployments with immensely diverse geophysical and environmental conditions. In addition, a wide variety of landmine employment techniques are available to adversaries (e.g., surface and buried, metal and plastic, on-route and off-route, patterned and un-patterned). This has led to a remarkable breadth and range of signatures from mines and the background environment. Lack of a precise understanding of this environmental diversity, its regional characteristics, and the local mine-environment context has hampered the development of both optimum sensor operational parameters and signal processing/automated target detection techniques to reduce nuisance false alarms. Other factors limiting performance include, but are not limited to: the particularly challenging and dynamic conditions posed by some environments; sensor noise and/or interference sources; and platform geolocation accuracy to support various imaging techniques, change detection and sensor fusion. Finally, understanding when and where to use various sensor and neutralization configurations and/or modalities is a key component to reaching the Army goal of system of systems optimization. Expedient mine neutralization presents challenges of similar magnitude to sensing in the context of the desired rapid operational tempo of the Future Force.

To address these shortfalls and needs, the Army has initiated a major research effort on countermine sensing phenomenology, and will establish a University Countermine Research Center (UCRC) to work together with the Army to develop key knowledge and technology underpinnings in the area of environmental phenomenology for its landmine detection program. The UCRC will emphasize the acquisition of new knowledge about the environment from which robust environmental characterizations and modeling capabilities will be developed and will have a special focus on transitioning the knowledge, models,

techniques, and understanding to relevant Army Laboratories and Project Managers. The specific technical factors to be addressed by the UCRC are (in priority order):

Soil Science and Environmental Physics;
Sensor Physics;
Signal Processing and Automated Target Detection Techniques; and
Sensor Management

Prior efforts undertaken by the Army technical base research and development community have indicated that several sensing modalities may have a significant role to play in reliable detection of mines and minefields – both from ground-based and airborne platforms. These include: high resolution, imaging radar; electromagnetic induction; nuclear quadrupole resonance detection; seismic/acoustic imaging; narrow-band and broadband infrared detection; and hyperspectral imaging. The Army seeks an interdisciplinary team and approach where the technical factor components complement each other, and provide a key contribution to projected Army landmine sensor environmental phenomenology research, and development effort in order to provide Army project officials with actionable knowledge, capabilities, methods, and techniques to more quickly achieve the goal of reliable detection of landmines and minefields in support of the nation's soldiers and marines.

3.1.2. Research Program Objectives.

3.1.2.1. Factor One: Soil Science and Environmental Physics. The primary research areas of this factor could include:

- Characterizing, in a detailed manner, the physical nature of the top half-meter of soil affecting landmine sensing and neutralization. This would include descriptions of different soil types and their degree of heterogeneity under various environmental and climatic conditions; the soil physical properties that affect landmine sensors and their intrinsic interrelationships, geospatial scaling behavior, and natural variation in different soil types, environments, and climates; moisture content spatial and temporal variability; ground cover and its potential impact on performance, surface roughness scale, correlation length, variability and persistence; soil volumetric obstructions and voids; and underground biomass content, structure, mechanical properties and moisture/heat modification potential. Because many important soil properties are not routinely measured, but depend in a fairly direct and predictable manner on common soil characteristics, it may be necessary to develop pedotransfer function models that use measured soil parameters to predict unmeasured soil properties. Further it may prove necessary to identify similar transfer functions for soil-plant exchange of moisture and energy in mine-prone terrain types. Both field and laboratory work are considered necessary to develop methodologies to relate the performance of different sensor modalities to measured soil properties.

- Undertaking the statistical characterizations of different soil types that are necessary to separate the contribution of the natural geological background from the target signal in the data acquired by different landmine sensing modalities.
- Investigating the anisotropic 3-D distribution of soil moisture in different soil types under different climatic conditions, the dynamic behavior of soil moisture for different weather conditions in various environments, characterizing the fundamental spatial-temporal covariance structure of the soil moisture for different degrees of soil heterogeneity and spatial sampling scales, categorizing soil moisture variability across different spatial scales, and describing quantitatively the errors that derive from discrete ground-based sampling approaches of variable soil moisture fields. Based upon this knowledge, an analysis will be undertaken of different remote sensing and geophysical sensor technologies and approaches to provide accurate soil moisture content estimates at both the landmine and minefield scales that will, ultimately, lead to the development of new and improved techniques to remotely determine soil moisture.
- Developing soil physical models appropriate for key sensing and neutralization modalities based upon numerical inversion approaches to predict soil moisture, temperature profiles, and soil heat flux from sequential passive remote sensing observations. The models will be used to support a simulation capability to describe the landmine within its dynamic and heterogeneous environment for different sensor modalities and to thoroughly understand the many different facets of the complex, non-linear, geo-environmental interactions that occur between a surface-deployed or buried landmine and its ambient environment. These would include mine-target-soil interactions that affect complex dielectric characterizations for electromagnetic sensing means; thermal behavior for EO/IR; spectroscopy for hyperspectral sensing; and mechanical wave propagation properties for acoustic/seismic sensing and mine neutralization.
- Examining and quantitatively describing the mine emplaced in the environment to establish the modification of the state and conditions of the host environment associated with the act of deploying a landmine or array of mines underground. This would include a description and modeling of the different soil properties associated with the fill dirt and how they vary temporally and spatially; differences in biomass/ground cover associated with long term deployed mines; and short-term and long-term soil porosity and moisture changes in and around the mine deployment site.
- Defining the most important soil and ground cover properties related to landmine detection and neutralization techniques, useful in adapting sensor and sensor fusion approaches, and then developing techniques for estimating and/or inferring these key properties from remote measurements.

The aim of the research under Factor One is to transition the various descriptions, characterizations, and models applicable to sensing and neutralization developed under this

factor to the Army phenomenology research effort. The objective is full compatibility with Factor Two, the Sensor Physics Factor, where the research products obtained by the Factor One effort can be utilized by, and/or embedded in, detailed sensor-specific predictive models for use in determining target and background signatures for advanced sensor technologies such as, but not limited to, wideband imaging radar, spectral and broadband infrared imaging, multi and hyperspectral imaging, seismic/acoustic surface imaging, and nuclear quadrupole resonance detection. The Factor One research effort should also aim to provide the Army with remote characterizations appropriate for understanding the efficacy of selected sensor modalities for worldwide soil types and all-season/all-weather operations. Furthermore, research in Factor One should closely coordinate with Army experimental programs.

3.1.2.2. Factor Two: Sensor Physics. The primary research areas for this factor could include:

- Improving the fundamental understanding of the interaction of signals of the earth and buried mines across a wide range of mine targets and geo-environmental conditions.
- Developing and validating predictive models to improve computation of the signatures from targets and background in representative mine deployments of interest to the Army, and provide characterizations useful for determining projected sensor performance.
- Investigating optimum configurations/parameterization of prominent sensor given particular mine deployments and/or background conditions as identified in Factor One.
- Exploring and then identifying robust target/clutter discrimination features by sensor type, soil type, and background clutter condition.

A major aspect of the research to be undertaken as a part of the Factor Two program will be to survey available predictive models and, in consultation with the Army, adapt, extend, and/or develop algorithms and/or analytical models with the capability to import the appropriate geophysical descriptions from first principles. This topic area requires a measurement component that should be conducted with the appropriate Army sensor laboratories. This work will complement the Army's research efforts to reliably compute signatures from targets in relevant backgrounds. New algorithms and/or analytical models that are developed will be transitioned to the Army and installed on government computing assets, including the simulation testbed, and government personnel will be trained in their use. The algorithms and/or analytical models will also be utilized to estimate performance from existing or new developmental sensors; suggest parameters for optimizing such sensors; and large-scale parametric analyses will be undertaken to isolate and identify robust discrimination features for different background conditions and/or mine deployments.

3.1.2.3. Factor Three: Signal Processing and Automated Target Detection Techniques. The primary research areas for this factor could include:

- Developing signal and image processing techniques and strategies to optimize detection probability and minimize false alarms for a particular sensor type.
- Creating innovative methods to minimize artifacts and interference sources found in real-world sensors.
- Characterizing terrain and environmental processes that cause clutter in the sensor scene.
- Exploring sensor and data fusion concepts and techniques – both to identify highest payoff sensor combinations by mine deployment and background condition and innovative methods that will ensure registration from disparate sensors, which may be deployed on different platforms operating at different times.

The aim of the research under Factor Three is the development of complementary signal processing techniques for sensor receiver hardware that will optimize detection probability of a landmine target from the background conditions identified in the Factor One research program. This will require collaboration with related government research efforts to suggest methods and develop algorithms to reduce artifacts in existing and/or developmental sensors (where examples include, but are not limited to: Radio Frequency Interference or RFI in low frequency SAR and NQR, A/D converter noise, sidelobe mitigation in imaging radar, etc.). The single and multi-sensor advanced target detection techniques, algorithm source codes, theory of operation, and estimates of processing loads required for implementing newly developed techniques in real-time or near real-time systems developed under the Factor Three effort will be transitioned to the government.

3.1.2.4. Factor Four: Sensor Management. The primary research areas for this factor could include:

- Investigating and suggesting the best mix of sensor type, employment strategy, and signal processing for representative mine deployments and background conditions identified in Factor One - given complete freedom to optimize overall system of systems performance.
- Identifying and evaluating methods, techniques, and signal processing approaches to optimize mine and mine field detectability given the remotely sensed and/or modeled background conditions identified in Factor One - given the sensor selection and parameterization is determined by existing sensor types and those currently in development.

The aim of the research under Factor Four is to develop tools for predicting the performance of individual and multiple sensor types under different environmental deployments. It is expected that this will occur through a collaboration with government

researchers to utilize these tools to predict performance in a variety of background conditions through a broad range of constraints on the availability of sensor timelines and types; a collaboration with government specialists to validate accuracy of predictions using measured data from ongoing Army programs; and the suggestion of novel signal processing or unusual pairings of sensor type to achieve enhanced performance (where examples would include, but not be limited to, the use of high resolution imagery to detect large scale obstacles sometimes co-located with mine fields, the use of moving target indicator or MTI radar to detect unusual omissions in adversary mobility routes which might indicate a presence of a mine field, etc.).

3.2. Program Management Volume

The function of the UCRC is to conduct basic and early applied research in environmental and theoretical phenomenology with the aim of improving current understanding of the geo-environmental effects of mine/minfield sensing and neutralization approaches and to develop novel solutions for applications of particular interest to the Army. This shall be accomplished in a number of ways, including performing research and visits to Army sites by faculty, post-docs, and graduate students. Furthermore, the UCRC will provide opportunities for Army researchers to visit UCRC facilities for extended periods.

3.2.1. Technology Transition Management Plan

The goal of the center is to research the phenomenology, test the concepts, develop models, algorithms, and sensor concepts, validate experimentally, and to document and transition the results. This will require that the UCRC coordinate with Army agencies to demonstrate and/or prepare Army R&D personnel to employ the models and techniques to ensure full and complete transition of research results.

3.2.1.2. Interface with the Army

The objective of any interface with the Army is to ensure the relevance of the research and to rapidly transition innovations derived from UCRC research. In particular, close coordination, collaboration, and transition measures should focus on the ERDC countermine phenomenology program and related programs at Army sensor laboratories. The Technology Transition Management Plan must describe the efforts the UCRC will perform to implement transition opportunities with the Army and the mechanisms it will use to transfer the technology to the Army. It is expected that the Technology Transition Management Plan will clearly explain how Center personnel will directly coordinate research with the Army on a continuing basis. Army participation is considered crucial to the success of this center. University planning should be explicit in its description of a personnel exchange program wherein qualified visiting Army scientists or engineers could work closely with university investigators. To provide technical guidance and assistance in assessing the Army relevance of proposed research, the Army anticipates designating technical advisors from relevant Army laboratories and research centers. The plan will specify the administrative and personnel commitment to enable a thriving technology transition between the Army and the UCRC.

3.2.1.2. Interface with Other University and Government Sponsored Facilities

To augment in-house capabilities, it is important that the UCRC interface the broader academic and government R&D community. It may be of necessity that the university partner with other universities to be able to accomplish the overall goals. It may also be essential to partner with government R&D agencies to accomplish the goals herein. Such cooperative efforts are strongly encouraged.

3.2.1.3. Interface with Industry

In addition to interfacing and partnering with universities, the UCRC may need to work with or even partner with selected industry. The UCRC will be structured to offer free sharing of information obtained in the cooperative environment while appropriately protecting industry-specific intellectual property.

3.3. Cost Volume

3.3.1. Estimated Costs

The financial portion of the proposal should contain cost estimates sufficiently detailed for meaningful evaluation of the proposals. Offerors shall use ARO Form 99, Summary Proposal Budget, obtainable at www.aro.army.mil/forms/forms2.htm#fm.baa, to submit budget data. The total basic costs will be evaluated for cost realism and reasonableness within funding constraints. For budget purposes, offerors shall use an award start date of 15 December 2003 and a program duration of eight (8) years. The budget must include annual breakdowns along with a total five year program budget projected for the basic award period plus three one-year options as follows:

FY 04 \$2.5M 6.1 funding
FY 05 \$5.0M 6.1 funding
FY 06 \$5.0M 6.1 funding + \$2.5M 6.2 funding
FY 07 \$5.0M 6.1 funding + \$2.5M 6.2 funding
FY 08 \$5.0M 6.1 funding + \$2.5M 6.2 funding

FY 09 (Option Period 1) \$5.0M 6.1 funding + \$2.5M 6.2 funding
FY 10 (Option Period 2) \$5.0M 6.1 funding + \$2.5M 6.2 funding
FY 11 (Option Period 3) \$5.0M 6.1 funding + \$2.5M 6.2 funding

4. ELIGIBILITY

Proposals may be submitted only by degree-granting universities located within the United States. Industrial firms may not submit proposals to this competition.

5. INSTRUCTIONS AND OTHER INFORMATION TO OFFERORS

The selection process will be conducted on the basis of a competitive technical peer review to insure that any resulting award is made with the greatest confidence that the selected university best meets the objectives of the UCRC.

5.1. Proposal Format Information

The proposal shall be provided in three volumes, each bound separately in a manner suitable to facilitate handling and distribution. Each volume should be concise, utilizing one side of each page with no foldout pages. Specific page limitations are described below. Each proposal must be typed or printed (with type that is no smaller than 12 point on standard 8 ½" x 11" paper with one (1) inch margins, 6 lines per inch). In addition, each of these volumes shall contain a table of contents that is included within the page limitations and recommended formats set forth below.

5.1.1. Research Program Volume

The pages included in the Research Program Volume shall be numbered. Offerors are advised that the Research Program Volume of the proposal shall not exceed 25 pages (including figures), plus a one-page vita per investigator. Offerors are cautioned that pages in excess of the 25-page limitation, and pages in excess of the 1 page limitation for the vitae, will not be included in the evaluation. Inclusion of research manuscripts and reprints is strongly discouraged and will be counted against the 25-page limit. The layout of the Research Program Volume is recommended as follows:

- A. Table of Contents
- B. Executive Summary
- C. Research Plan
- D. Brief (maximum 1 page) vitae for each investigator

5.1.2. Program Management Volume

The pages included in the Program Management Volume shall be numbered. Offerors are advised that the Program Management Volume of the proposal shall not exceed 20 pages. Offerors are cautioned that pages in excess of the 20-page limitation will not be included in the evaluation. The layout of the Program Management Volume is recommended as follows:

- A. Table of Contents
- B. Executive Summary
- C. Program Management Plan
 - 1. Technology Transition Management Plan
 - (i) Interface with the Army
 - (ii) Interface with Other University and Government Sponsored Facilities
 - (iii) Interface with Industry

5.1.3. Cost Volume

5.1.3.1. There is no page limit for the Cost Volume. Offerors' formats are permitted. A cost-element breakdown should be provided for the first 5-year performance period with budgets provided for each year. Breakdowns for the 3 one-year option periods shall be provided.

5.1.3.2. Budget is an important consideration in both peer and programmatic review, and applicants are cautioned to use discretion in budget requests. Budgets will also be reviewed during award negotiations. Complete justifications must be provided for expenses in all categories. The ARO Form 99, Summary Budget Form, shall be used for budget submission which can be located at www.aro.army.mil/forms/forms2.htm#fm.baa. Each item in the budget should be clearly justified on an attached Justification Page.

5.1.3.3. The following provides instructions for preparing the budgets.

5.1.3.3.1. Direct Labor. Show the current and projected salary amounts in terms of man-hours, man-months, or annual salary to be charged by the principal investigator(s), faculty, research associates, postdoctoral associates, graduate and undergraduate students, other technical personnel either by personnel or position. State the number of man-hours used to calculate a man-month or man-year. Research during the academic term is deemed part of regular academic duties, not an extra function for which additional compensation or compensation at a higher rate is warranted. Consequently, academic term salaries shall not be augmented either in rate or in total amount for research performed during the academic term. Rates of compensation for research conducted during non-academic (summer) terms shall not exceed the rate for the academic terms. When part or all of a person's services are to be charged as project costs, it is expected that the person will be relieved of an equal part or all of his/her regular teaching or other obligations. For each person or position, provide the following information:

5.1.3.3.1.1. The basis for the direct labor hours or percentage of effort (e.g., historical hours or estimates).

5.1.3.3.1.2. The basis for the direct labor rates or salaries. Labor costs should be predicted upon current labor rates or salaries. These rates may be adjusted upward for forecast salary or wage cost-of-living increases that will occur during the agreement period. The cost proposal should separately identify the rationale applied to base salary/wage for cost-of-living adjustments and merit increases. Each must be fully explained.

5.1.3.3.1.3. The portion of time to be devoted to the proposed research, divided between academic and non-academic (summer) terms, when applicable.

5.1.3.3.1.4. The total annual salary charged to the research project.

5.1.3.3.1.5. Any details that may affect the salary during the project, such as plans for leave and/or remuneration while on leave.

5.1.3.3.2. Indirect Costs (F&A, fringe, and other). The most recent rates, dates of negotiation, base(s), and periods to which the rates apply should be disclosed along with a statement identifying whether the proposed rates are provisional or fixed. A copy of the most recent Rate Agreement should be provided.

5.1.3.3.3. Permanent Equipment. An itemized list of permanent equipment showing the cost for each item shall be provided. Permanent equipment is any article or tangible nonexpendable property having a useful life or more than one year and an acquisition cost of \$5,000 or more per unit. The basis for the cost of each item of permanent equipment included in the budget must be disclosed, such as:

5.1.3.3.3.1. Vendor Quote. Show name of vendor, number of quotes received and justification, if intended award is to other than lowest bidder.

5.1.3.3.3.2. Historical Cost. Identify vendor, date of purchase, and whether or not cost represents lowest bid.

5.1.3.3.3.3. Engineering Estimate. Include rationale for quote and reason for not soliciting current quotes.

5.1.3.3.3.4. Special test equipment to be fabricated by the awardee for specific research purposes and its costs (if applicable).

5.1.3.3.3.5. Existing equipment to be modified to meet specific research requirements, including modification costs (if applicable). Do not include equipment the organization will purchase with its funds if the equipment will be capitalized for Federal income tax purposes. Proposed permanent equipment purchases during the final year of this project shall be limited and fully justified.

Grants and cooperative agreements may convey title to the institution for equipment purchased with project funds. At the discretion of the Grants Officer, the agreement may provide for retention of the title by the Government or may impose conditions governing the equipment conveyed to the institution.

5.1.3.3.4. Travel. Forecasts of travel, expenditures (domestic and foreign) that identify the destination and the various cost elements (airfare, mileage, per diem, etc.) must be submitted. The costs should be in sufficient detail to determine the reasonableness of such costs. Allowance for air travel normally will not exceed the cost of round-trip, economy air accommodations. Specify the type of travel and its relationship to the research project.

5.1.3.3.5. Participant Support Costs. This budget category refers to costs of transportation, per diem, stipends, and other related costs for participants or trainees (but not employees) in connection with ARO-sponsored conferences, meetings, symposia, training activities

and workshops. The number of participants to be supported should be entered in the parentheses on the budget form. These costs should also be justified in the budget justification page(s).

5.1.3.3.6. Materials and Supplies. A general description and total estimated cost of expendable equipment and supplies are required. The basis for developing the cost estimate (vendor quotes, invoice prices, engineering estimates, purchase order history, etc.) must be included. If possible, provide a material list.

5.1.3.3.7. Publication, Documentation, and Dissemination. The budget may request funds for the cost of preparing, publishing, or otherwise making available to others the findings and products of the work conducted under an agreement, including cost of reports, reprints, page charges, or other journal costs (except costs for prior or early publication); necessary illustrations, cleanup, documentation, storage, and indexing of data and databases; and development, documentation, and debugging of software.

5.1.3.3.8. Consultant Costs. Offerors normally are expected to utilize the services of their own staff to the maximum extent possible in managing and performing the project's effort. If the need for consultant services is anticipated, the nature of proposed consultant services should be justified and included in the technical proposal narrative. The cost proposal should include the names of consultant(s), primary organizational affiliation, each individual's expertise, daily compensation rate, number of days of expected service, and estimated travel and per diem costs.

5.1.3.3.9. Computer Services. The cost of computer services, including computer-based retrieval of scientific, technical, and educational information, may be requested. A justification/explanation based on the established computer service rates at the proposing institution should be included. The budget also may request costs, which must be shown to be reasonable, for leasing automatic data processing equipment. The purchase of computers or associated hardware and software should be requested as items of equipment.

5.1.3.3.10. Subawards. A description of services or materials that are to be awarded by subcontract or subgrant is required. For awards total \$10,000 or more, provide the following specific information:

5.1.3.3.10.1. Identification of the type of award to be used (e.g., cost reimbursement, fixed price).

5.1.3.3.10.2. Identification of the proposed subcontractor or subgrantee, if known, and an explanation of why and how the subcontractor or subgrantee was selected or will be selected.

5.1.3.3.10.3. Whether the award will be competitive and, if noncompetitive, rationale to justify the absence of competition.

5.1.3.3.10.4. A copy of the proposed subawardee's cost proposal.

5.1.3.3.11. Other Direct Costs. Itemize and provide the basis for proposed costs for other anticipated direct costs such as communications, transportation, insurance, and rental of equipment other than computer related items. Unusual or expensive items shall be fully explained and justified.

5.2. Marking of Proposals and Disclosure of Proprietary Information Outside the Government.

5.2.1. The proposal submitted in response to this solicitation may contain technical and other data that the offeror does not want disclosed to the public or used by the Government for any purpose other than proposal evaluation. Information contained in unsuccessful proposals will remain the property of the offeror except for that evidenced in the Proposal Cover Page and Project Summary. The Government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements. If proprietary information which constitutes a trade secret, proprietary commercial or financial information, confidential personal information, or data affecting the national security, is provided by an offeror in a proposal, it will be treated in confidence, to the extent permitted by law, provided that the following legend appears and is completed on the front of the proposal: "For any purpose other than to evaluate the proposal, this data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part, provided that if an award is made to the offeror as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction is contained in page(s) _____ of this proposal." Any other legend may be unacceptable to the Government and may constitute grounds for removing the proposal from further consideration without assuming any liability for inadvertent disclosure. The Government will limit dissemination of properly marked information to within official channels. In addition, the pages indicated as restricted must be marked with the following legend: "Use or disclosure of the proposal data on lines specifically identified by asterisk (*) are subject to the restriction on the front page of this proposal." The Government assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose. In the event that properly marked data contained in a proposal submitted in response to this BAA is requested pursuant to the Freedom of Information Act, 5 USC 552, the offeror will be advised of such request and, prior to such release of information, will be requested to expeditiously submit to ARO a detailed listing of all information in the proposal which the offeror believes to be exempt from disclosure under the Act. Such action and cooperation on the part of the offeror will ensure that any information released by ARO pursuant to the Act is properly determined.

5.2.2. By submission of a proposal, the offeror understands that proprietary information may be disclosed outside the Government for the sole purpose of technical evaluation. The ARO/RMAC will obtain a written agreement from the evaluator that proprietary information in the proposal will only be used for evaluation purposes and will not be

further disclosed or utilized. Funded proposals may be subject to public release under the Freedom of Information Act; proposals that are not selected for funding will not be subject to public release.

5.3. Proposal Submission Information. Proposals must be submitted according to the instructions contained herein. A Proposal Cover Sheet (ARO Form 51) shall be submitted with the proposal. This form can be found at www.aro.army.mil/forms/forms2.htm#fm.baa Proposals in connection with this BAA are due by 4:00 p.m. local time on 10 October 2003 A proposal shall consist of the following:

PROPOSAL ITEM/VOLUME	NUMBER OF COPIES
Proposal Cover Sheet (ARO Form 51) with Authorized Signature(s)	Original and 1 copy
Research Program Summary (A brief 1-2 page abstract that summarizes the content of the Research Program of the proposal.)	Original and 12 copies
Research Program Volume (to include Biographical Sketches)	Original and 12 copies
Program Management Volume	Original and 12 copies
Cost Volume	Original and 12 copies

NOTE: There will be NO electronic submission of proposals in connection with this BAA.

Proposals must be submitted directly to the following address:

For United States Postal Service:
U.S. Army Robert Morris Acquisition Center
Research Triangle Park Contracting Division
ATTN: AMSSB-ACC-R (Andrew Day)
P. O. Box 12211
Research Triangle Park, NC 27709-2211

For FedEx, UPS, etc.:
U.S. Army Robert Morris Acquisition Center
Research Triangle Park Contracting Division
ATTN: AMSSB-ACC-R (Andrew Day)
4300 South Miami Boulevard
Durham, NC 27703-09142

5.4. BAA Amendments: Amendments to this BAA will be released via the Internet on the ARO web-site (<http://www.aro.army.mil>). Offerors are encouraged to monitor the ARO web-site to ensure they have any and all amendments to the BAA prior to submitting a proposal.

5.5. Catalog of Federal Domestic Assistance (CFDA) Number: 12.431

5.6. Cost Sharing: Not required.

5.7. Anticipated Instrument Type: Cooperative Agreement

5.8. Profit or Fee: In accordance with Department of Defense (DOD) Grant and Agreement Regulations (DOD 3210.6-R), a cooperative agreement awarded as a result of this BAA will not provide for profit or fee.

5.9. Late Submissions, Modifications and Withdrawals of Proposals: (a) Offerors are responsible for submitting proposals, and any revisions, and modifications, so as to reach the Government office designated in the solicitation by the time specified in the BAA. (b) (1) Any proposal, modification, or revision, that is received at the designated Government office after the exact time specified for receipt of proposals is "late" and will not be considered unless it is received before award is made, the grants officer determines that accepting the late proposal would not unduly delay the acquisition; and (i) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of proposals and was under the Government's control prior to the time set for receipt of proposals; or (ii) It was the only proposal received. (2) However, a late modification of an otherwise successful proposal, that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted. (c) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel. (d) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the Government office by the due date, and urgent Government requirements preclude amendment of the BAA closing date, the due date will be deemed to be extended to the same time of day specified in the BAA on the first work day on which normal Government processes resume. (e) Proposals may be withdrawn by written notice at any time before award. (f) The grants officer must promptly notify any offeror if its proposal, modification, or revision was received late, and must inform the offeror whether its proposal will be considered, unless an award is imminent and the notice of award would suffice. (g) Late proposals and modifications that are not considered must be held unopened, unless opened for identification, until after award and then retained with other unsuccessful proposals.

5.10. Military Recruiting on Campus: This is to notify potential offerors that the award under this announcement to an institution of higher education shall include the provision: Military Recruiting on Campus.

5.11. CCR Registration: In accordance with DOD policy, prospective awardees must be registered in the Department of Defense (DOD) CENTRAL CONTRACTOR REGISTRATION (CCR) DATABASE prior to award of this cooperative agreement. By submission of an offer resulting from this BAA, the offeror acknowledges the requirement

that a prospective awardee must be registered in the CCR database prior to award, during performance, and through final payment of any award resulting from this BAA.

5.12. Use of Human Subjects and Laboratory Animals: Awardees under this BAA must comply with applicable provisions of national policies concerning research involving the use of live organisms.

5.12.1. Human Subjects: For human subjects, the provisions include the Common Federal Policy for the Protection of Human Subjects codified by the Department of Health and Human Services at 45 CFR part 46 and implemented by the Department of Defense at 32 CFR part 219.

5.12.2. Animals: For animals, the provisions include rules on animal acquisition, transport, care, handling, and use in: (i) 9 CFR parts 1-4, Department of Agriculture rules that implement the Laboratory Animal Welfare Action of 1966 (U.S.C. 2131-2156); and (ii) the "Guide for the Care and Use of Laboratory Animals," National Institutes of Health Publication No. 86-23.

5.13. Reports: The number and types of reports will be specified in the award document. It is anticipated that the reports shall be prepared and submitted in accordance with the procedures contained ARO Form 18 and mutually agreed on before award. A Final Report that summarizes the project and tasks is required at the conclusion of the performance period. See www.aro.army.mil for ARO Form 18 instructions and types of reports.

5.14. Certifications and Assurances for Assistance Agreements: By signing and submitting a proposal or accepting an award, the recipient provides the following assurances and certifications in compliance with the Department of Defense Grants and Agreements Regulations, Part 22 and Appendices A and B.

5.14.1. Certification for Contracts, Grants, Loans, and Cooperative Agreements

The recipient certifies, to the best of his or her knowledge and belief, that:

(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the making of any Federal grant, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal grant or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal cooperative agreement, the undersigned shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The recipient shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31 U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

5.14.2. Certification Regarding Debarment, Suspension, and Other Responsibility Matters—Primary Covered Transactions

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

5.14.3. Military Recruiting and Reserve Officers Training Corp (ROTC) Program Access to Institutions of Higher Education

As a condition for receipt of funds available to the Department of Defense (DoD) under an award, the recipient assures that it is not an institution of higher education (as defined in 32 CFR part 216) that has a policy of denying, and that it is not an institution of higher education that effectively prevents, the Secretary of Defense from obtaining for military recruiting purposes: (A) entry to campuses or access to students on campuses; or (B) access to directory information pertaining to students. If the recipient is determined, using the procedures in 32 CFR part 216, to be such an institution of higher education during the period of performance of an agreement, and therefore to be in breach of this clause, the Government will cease all payments of DoD funds under the agreement and all other DoD

grants and cooperative agreements to the recipient, and it may suspend or terminate such grants and agreements unilaterally for material failure to comply with the terms and conditions of award.

5.14.4. Assurance of Compliance with Title VII of the Civil Rights Act of 1964

Compliance with Title VII of the Civil Rights Act of 1964 (P.L. 88-352) is assured by the signature on the award. In accordance with Title VI of that Act, no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or otherwise subjected to discrimination under any program or activity for which the Applicant receives Federal financial assistance from the U.S. Government; and hereby gives assurance that it will immediately take any measures necessary to effectuate this agreement.

This assurance is given in consideration of and for the purpose of obtaining any and all Federal grants, cooperative agreements, loans, contracts, property, discounts or other Federal financial assistance extended after the date hereof to the Applicant by the U.S. Government, including installment payments after such date on account of applications for Federal financial assistance which were approved before such date. This assurance is binding on the Applicant, its successors, transferees, and assignees, and the person or persons whose signatures appear on the award.

5.14.5. Certification Regarding Drug-Free Workplace Requirements Alternate I.

A. The grantee certifies that it will or will continue to provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing an ongoing drug-free awareness program to inform employees about—
 - (1) The dangers of drug abuse in the workplace;
 - (2) The grantee's policy of maintaining a drug-free workplace;
 - (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
- (c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will—

(1) Abide by the terms of the statement; and

(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(e) Notifying the agency in writing, within ten calendar days after receiving notice under paragraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grants officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (d)(2), with respect to any employee who is so convicted—

(1) Taking appropriate personnel action against such employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

B. The offeror may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant: Place of Performance (Street address, city, county, state, zip code)_____.

_____ . Check () if there are workplaces on file that are not identified here.

5.14.6. Clean Air and Water

If the amount of this award exceeds \$100,000, the recipient assures compliance with the Clean Air Act (42 U.S.C. 1857) as amended; the Federal Water Pollution Control Act (33 U.S.C. 1251), as amended; Executive Order No. 11738; and the related regulations of the Environmental Protection Agency (40 CFR, Part 15).

5.14.7. Officials Not To Benefit

The recipient assures that no member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit arising from it, in accordance with 41 U.S.C.22.

5.14.8. Preference For U.S. Flag Carriers

The recipient assures that travel supported by U.S. Government funds under this agreement shall use U.S.-flag air carriers (air carriers holding certificates under 49 U.S.C. 41102) for international air transportation of people and property to the extent that such service is available, in accordance with the International Air Transportation Fair Competitive Practices Act of 1974 (49 U.S.C. 40118) and the interpretative guidelines issued by the Comptroller General of the United States in the March 31, 1981, amendment to the Comptroller General Decision B138942.

5.14.9. Cargo Preference

The recipient assures that it will comply with the Cargo Preference Act of 1954 (46 U.S.C. 1241) as implemented by Department of Transportation regulations at 46 CFR 381.7, which require that at least 50 percent of equipment, materials or commodities procured or otherwise obtained with U.S. Government funds under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned, U.S.-flag commercial vessels, if available.

5.14.10. Radioactive Materials

The recipient assures compliance with the provisions of Title 10 CFR 21. This regulation establishes procedures and requirements for implementation of Section 206 of the Energy Reorganization Act of 1974.

5.14.11. Recombinant DNA

The recipient assures that all work involving the use of recombinant DNA will be in compliance with guidance provided at the following website: www4.od.nih.gov/oba.

5.15. Government Obligation

Offerors are cautioned that only an appointed Grants Officer may obligate the Government to the expenditure of funds. No commitment on the part of the Government to fund preparation of a proposal or to support research should be inferred from discussions with a technical project officer. Offerors that make financial or other commitments for a research effort in the absence of an actual legal obligation signed by the RMAC Grants Officer do so at their own risk.

5.16. Title to Inventions and Patents

In accordance with the Bayh-Dole Act (35 USC 200 *et seq*), title to inventions and patents resulting from such federally funded research may be held by the awardee or its collaborator, but the U.S. Government shall, at a minima, retain nonexclusive rights for the use of such inventions. An investigator must follow the instructions in the award agreement concerning license agreements and patents.

6. EVALUATION CRITERIA AND SELECTION PROCESS

6.1. Introduction

Evaluation of proposals will be conducted by a technical evaluation peer review. The Government reserves the right to appoint evaluators that are not government employees. All evaluators will be required to sign a certificate concerning Conflicts of Interest, Nondisclosure and Rules of Conduct.

The proposal selection process will be conducted based upon a technical peer review as described in the DOD Grant and Agreement Regulations (DOD 3210.6-R) (DODGARs), Section 22.315. All information necessary for the review and evaluation of a proposal must be contained in the Research Program, Program Management, and Cost Volumes. No other materials will be provided to the evaluators. An initial review of the proposals will be conducted to ensure compliance with the requirements of this BAA. The award will be based on an integrated assessment of each offeror's ability to satisfy this BAA's requirements and that offers the best value to the Government, cost and other factors considered. The Government anticipates discussion with offerors will be conducted; however, the Government reserves the right to make an award without discussions. The Army, at its discretion, may visit proposed sites during the proposal evaluation phase to verify information contained in the proposals. Any site visits will be coordinated with the offerors. Where applicable, it is anticipated that site visits would be scheduled during the week of 27 October 2003. An award will not be made if, in the opinion of the Grants Officer, it is not in the Government's best interest. In such a case, the program may be re-competed at a later time. This BAA is subject to the availability of funds.

6.2. Relative Importance of Factors and Subfactors

The Research Program Volume is significantly more important than the Program Management Volume. The Program Management Volume is significantly more important than the Cost Volume. Cost will be evaluated for realism and reasonableness only and will not be weighted.

Within the Research Program the research factor, "Soil Science and Environmental Physics," has the highest importance (more than half the effort), with the other areas "Sensor Physics," "Signal Processing and Automated Target Detection Techniques," and "Sensor Management" each of equal importance.

Within the Program Management Plan, the Technology Transition Management Plan is the only criteria to be evaluated.

6.3. Evaluation of the Research Program

6.3.1. Research Plan (Criteria 1-3)

The Research Plan evaluation will be based primarily on the following three criteria, of equal importance:

- 6.3.1.1. Scientific and technical merits of the proposed research;
- 6.3.1.2. Potential contribution of the research to the Army's counterintelligence requirements; and
- 6.3.1.3. Experience and qualifications of the principal investigator, other key research personnel, and the institution sponsoring the proposal and their demonstrated ability to achieve the proposed technical objectives.

6.4. Evaluation of Program Management

6.4.1. Technology Transition Management Plan (Criterion 4)

The Technology Transition Management Plan will be evaluated on the basis of one criterion addressing adequacy and completeness of the plan in the following three categories of sub-criterion evaluation factors, each of equal importance:

- (i) Interface with the Army
- (ii) Interface with other University and Government Sponsored Facilities
- (iii) Interface with Industry

The evaluation team will examine each of the individual criterion to determine if the proposed plan meets the objectives of this BAA.

6.5. Evaluation of Cost (Criterion 5)

The Cost evaluation will be based on one criterion:

- 1. The adequacy and appropriateness of the proposed facilities.

The proposed costs will also be evaluated for cost realism and reasonableness which is not a weighted factor.